

I claim:

1. A method for determining whether avian eggs are qualified or unqualified for a premium quality based on shell characteristics, comprising the steps of:

providing a plurality of the eggs;

oscillating the shells of each egg by a non-contacting source of ultrasonic waves to produce such a signal from the oscillating shells that is detectable by a non-contacting detector; and

determining whether each egg is qualified or not from analysis of the signal.

2. The method of claim 1 wherein the detected signal comprises an information portion that is analyzed for a positive indication comprising at least one sufficiently steady and strong peak.

3. The method of claim 2 wherein the analysis further comprises integrated response (IR) analysis of the detected signal.

4. The method of claim 2 wherein the positive indication is correlatable to a given quality determination of egg shell quality which in turn is associated with such a quality determination of the avian egg as relating to fertility or hatching or hatchling viability.

5. The method of claim 1 wherein the detected signal comprises an information portion that is analyzed for either or both a positive indication comprising at least one sufficiently steady and strong peak and/or a negative indication comprising relatively unsteady and weak signals across the width of the information portion.

6. The method of claim 1 wherein eggs qualified for premium quality are graduated to hatchery operations.

7. Premium quality eggs determined according to the method of claim 1.

8. A method for sorting out sub-grade avian eggs from premium grade avian eggs comprising the steps of:

providing a plurality of the eggs;

disposing each egg in the path of a non-contacting source of ultrasonic waves and in relative proximity to a non-contacting detector of a signal obtained from the egg under the influence of the ultrasonic waves; and

sorting the eggs as premium grade or sub-grade based upon analysis of the detected signal.

9. The method of claim 8 wherein the detected signal is transformable into a profile of detected signal strength versus time, which profile comprises an information portion that is analyzed for a positive indication of premium grade comprising at least one sufficiently steady and strong peak.

10. The method of claim 9 wherein the analysis further comprises integrated response (IR) analysis of the detected signal's strength versus time values.

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11. The method of claim 9 wherein the positive indication of premium grade is correlatable to egg shell quality which in turn is associated with such a quality determination of the avian egg as relating to fertility or hatching or hatchling viability.

12. The method of claim 8 wherein the detected signal is transformable into a profile of detected signal strength versus time, which profile comprises an information portion that is analyzed for either or both a positive indication of premium grade comprising at least one sufficiently steady and strong peak and/or a negative indication of premium grade comprising relatively unsteady and weak signals across the width of the information portion.

13. The method of claim 8 wherein eggs sorted into the premium grade are graduated to hatchery operations.

14. Premium grade eggs sorted according to the method of claim 8.

15. Apparatus for determining premium grade avian eggs from sub-grade avian eggs comprising:

a source of ultrasonic waves and an opposed ultrasonic detector in the path thereof spaced sufficiently to admit therebetween an egg without contact from either, wherein the egg produces a signal detectable by the detector in response to blocking the path of the ultrasonic waves from the source; and

a processor for determining the eggs as premium grade or not based upon analysis of the detected signal.

16. The apparatus of claim 15 wherein the processor includes services of an analyzer that transforms the detected signal into a profile comprising signal strength versus

time, which profile comprises an information portion that is analyzed for a positive indication of premium grade comprising at least one sufficiently steady and strong peak.

17. The apparatus of claim 16 wherein the analyzer further undertakes integrated response (IR) analysis of the detected signal's strength versus time values.

18. The apparatus of claim 16 wherein the positive indication of premium grade is correlatable to egg shell quality which in turn is associated with such a quality determination of the avian egg as relating to fertility or hatching or hatchling viability.

19. The apparatus of claim 15 wherein the processor includes services of an analyzer that transforms the detected signal into a profile of detected signal strength versus time, which profile comprises an information portion that is analyzed for either or both a positive indication of premium grade comprising at least one sufficiently steady and strong peak and/or a negative indication of premium grade comprising relatively unsteady and weak signals across the width of the information portion.

20. The apparatus of claim 15 wherein eggs sorted into the premium grade are graduated to hatchery operations.

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